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REPORT

ON

ELECTRIC POWER SERVICE FACILITIES

AT

25X1A

[redacted]

Prepared by

REAL ESTATE AND CONSTRUCTION DIVISION

OFFICE OF LOGISTICS

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INTRODUCTION

25X1A This report consists of a review of the electrical power facilities at [redacted], aimed at determining the changes required to make these facilities adequate for the purpose 25X1A intended. There are two main parts, one for [redacted] and one for [redacted], followed by a summary of recommendations and an estimate of cost. 25X1A

Summary of report is on page 4 of Section titled [redacted]. 25X1A

25X1A [redacted]

ESTIMATE OF THE SITUATION

PROBLEM: Revise present power system to provide adequate commercial power for all needs, and an emergency source for essential needs.

FACTS BEARING ON THE PROBLEM:

a. Present service consists of a 2400-volt line, connected to the power company's single-phase line at the eastern edge of the Government property and coming in to a 50 KVA transformer which, in turn, is connected by a short 240/120-volt line to the electrical load center housed in an adjacent building. See Drawing "A".

b. Power company owns above lines and transformer.

c. Emergency power is presently available from a 75 KVA single-phase diesel-driven generator, located at the load center.

d. Total connected load on [redacted] is 250 KVA. Present 25X1A maximum demand is approximately 70 KVA, which is approached at least once a day. Average load, based upon observations, is 55 KVA during a working day.

e. Power company is willing to convert the present 50 KVA single-phase service to a 112½ KVA, three-phase service, utilizing the present access route. Power will be metered at low voltage.

f. Power company is also willing to furnish three-phase service at any suitable point along the east and south sides of the Government reservation. In this case, the Government would buy power at high voltage at the property line.

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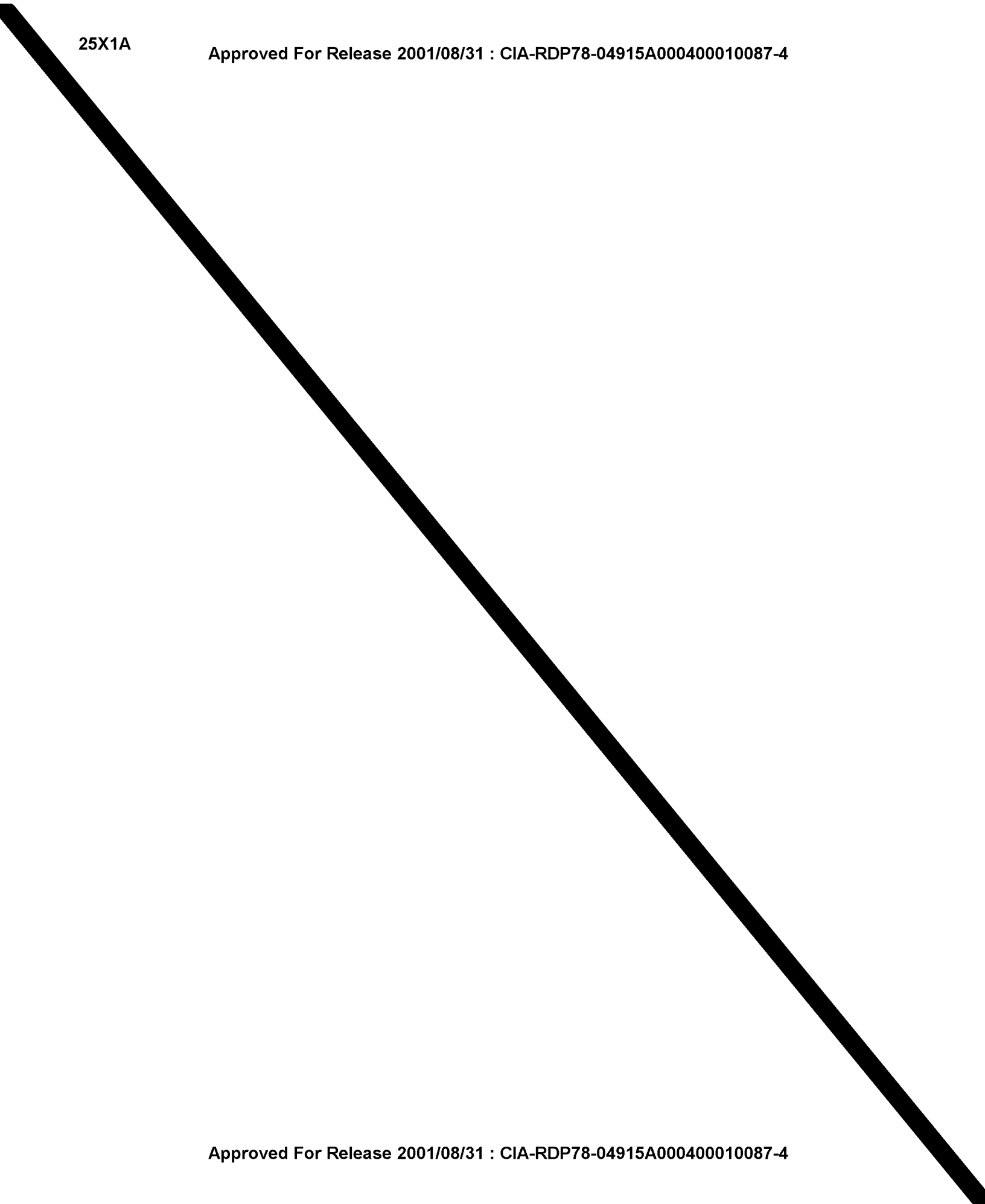

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b. Determine optimum route for the power line, and whether it should be high or low voltage.

c. Resolve corollary problems.

Regarding the various loads, there is rather little factual information or experience data available and it becomes necessary to make certain assumptions.

Reference is made to Tab 1. Accepted demand factors have been applied to each building in accordance with the type and purpose of the connected load. Based upon these computations, a maximum demand has been determined for each building, and an apparent total maximum demand for the whole station. This apparent maximum demand has been reduced by a diversity factor, since the probability is rather remote that the maximum demands for all buildings will occur at the same time. The conditions imposed by a full-use, around-the-clock, situation can be severe and it is felt that the diversity factor should not be less than 0.90. This results in a computed maximum demand, for the whole station, of 195.91 KVA for the present connected load, or a station demand factor of 0.77.

In addition to the present connected load, certain demands will be created by temporary quarters and facilities which will be constructed in the event of a national emergency. The extent of these demands can only be approximated. However, it is considered that the amount and demand factor would not be such as to cause a sustained station load in excess of the 225 KVA transformer capacity.

In view of the foregoing discussion, the estimated total maximum demand under emergency conditions is 195.91 KVA. The nearest standard size transformer bank is 225 KVA, consisting of three (3) 75 KVA transformers. It is recommended that such capacity be installed.

Regarding the new Records Center Building, this is a substantial load which should be served independently at high-line voltage, 2400-volts, with a separate transformer bank located at the building. The possible advent of such a building does not have any effect on determining the size of transformer bank needed for the present station load and can be disregarded at this time.

It is contemplated that three diesel-driven generators are required to provide standby power. The available generators are skid-mounted, General Motors 75 KVA, 80% Power Factor machines, self-contained, except for fuel supply. One would be sufficient

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to carry the Office and Dispensary and Guard Stations, with the remainder of the station entirely off except for a few small lights. An additional generator would permit all refrigeration and heating and a limited use of lights and electric cooking. A third generator would provide relief for the first two on a rotational basis. At present, only two generators are available for installation at [redacted] It is recommended that a power-house be constructed to accommodate three generators and that the two available machines be installed and a third machine be procured for later installation.

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Regarding an optimum route for the power line (incoming), three possibilities have been considered and one appears as an optimum solution. Briefly, these are:

Route A - utilize route of existing pole line.

Route B - install underground cable as indicated on Drawing "A".

Route C - construct new pole line along route indicated on Drawing "A".

Analysis of Route A:

Route A has been ruled out because, as can be seen from Drawing "A", the present single-phase power line is uncomfortably close to the water tank and [redacted] passing between these structures with a minimum side clearance of ten (10) feet, which is not a desirable condition. This route places the power line in close proximity with several radio antennas mounted on [redacted] thereby creating an interference problem. Also, the low voltage feeder from the transformers would pass under the roadway, necessitating expensive trenching.

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The maximum transformer capacity which the power company is willing to install is 112½ KVA, based upon current load conditions. The power company does not choose to recognize the need for providing sufficient transformer capacity as standby for all-out, full-use, operation. Further, they will not change the pole line from single to three-phase operation unless they also own the transformer bank to be served. This leaves the Government with very little option, since the station load under emergency conditions would exceed 112½ KVA by a considerable margin. As an alternative, the possibility of purchasing Route A and making necessary alterations thereto has been considered. However, the inherent faults of this route and the cost of the alterations combine to make this alternative appear impractical and not productive of the desired results.

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In view of the foregoing discussion, Route A has been eliminated from consideration.

Analysis of Route B:

Route B has been ruled out because of cost and certain inherent faults.

Because of crowded conditions in the vicinity of the station load center, it would be necessary to locate the transformers at the property line, as shown on Drawing "A". Thus, the underground line would operate at 120/208-volts, requiring multiple cables in order to carry a load in the neighborhood of 800 amperes. This type of construction is quite expensive, and the amount of clearing and trenching would make the whole cost of the incoming line prohibitive.

In addition to the high cost, Route B has certain features of inflexibility. With this route, the emergency power change-over switch necessarily would be located at the load center instead of the diesel powerhouse, so that the procedure of changing over to diesel operation would be awkward and time-consuming. Also, the metering point for Route B is screened from the rest of the reservation by undergrowth, trees and buildings, so that the constructing of the 2400-volt line to serve the new Records Center Building would be impractical and expensive.

In view of the foregoing discussion, Route B has been eliminated from consideration.

Analysis of Route C:

Route C appears to overcome the disadvantages of A and B and to have some advantages of its own. It would be over open ground at a comfortable distance from buildings and antennas and would run through a "draw" where no future building construction is likely. This route would run directly to the proposed powerhouse and transformer station so that there need be only one short low voltage feeder running to the load center. Route C has no clearing problems and no roadways to trench across. The line would be overhead and could be tapped at any point to provide service for the Records Center Building.

In view of the foregoing advantages, it is recommended that Route C be employed.

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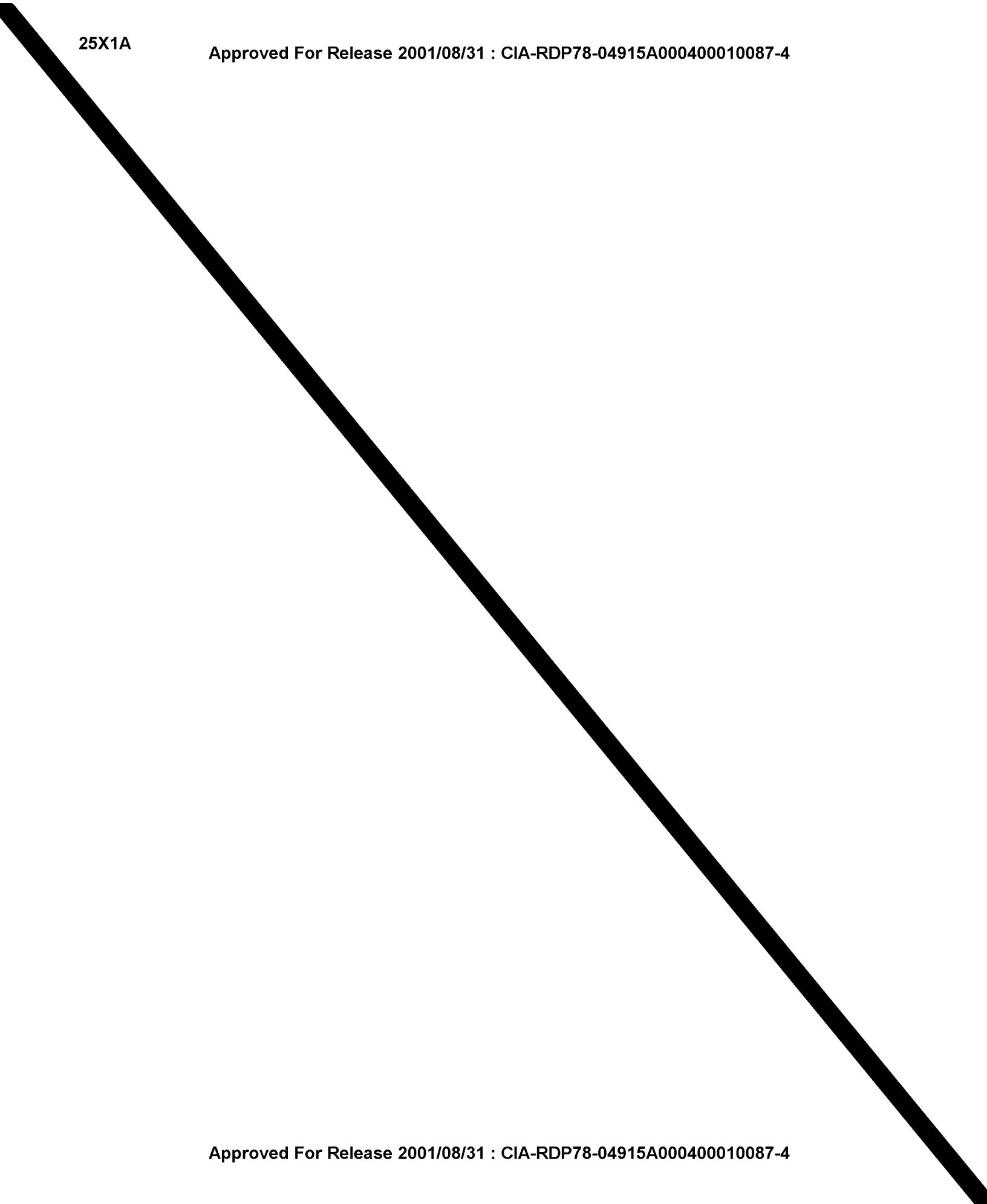

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